

March 27, 1945.

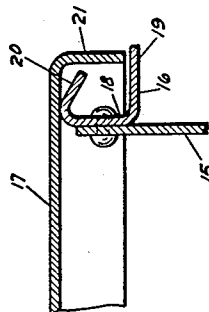
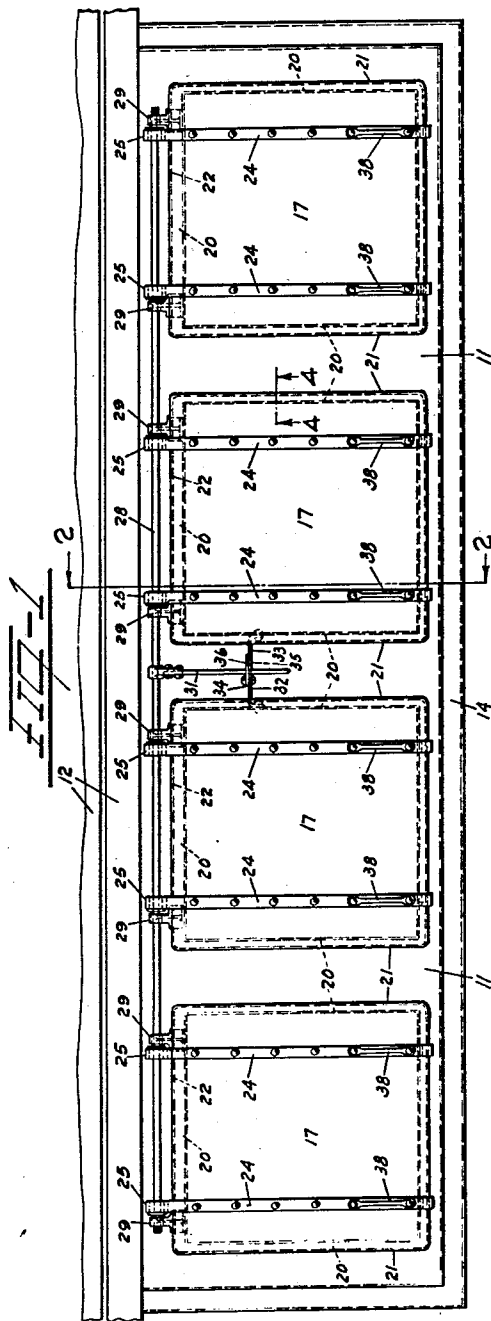
F. DITCHFIELD

2,372,369

RAILWAY HATCH COVER AND LOCKING MEANS THEREFOR

Filed March 9, 1944

2 Sheets-Sheet 1



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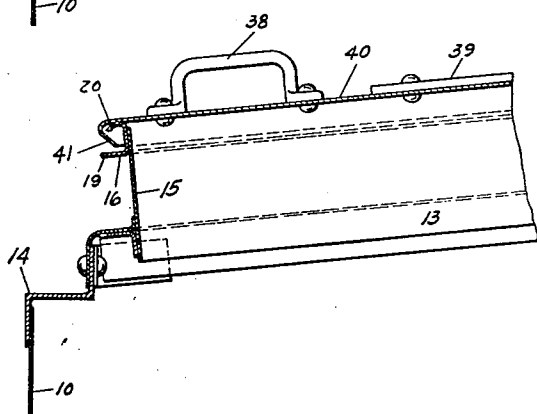
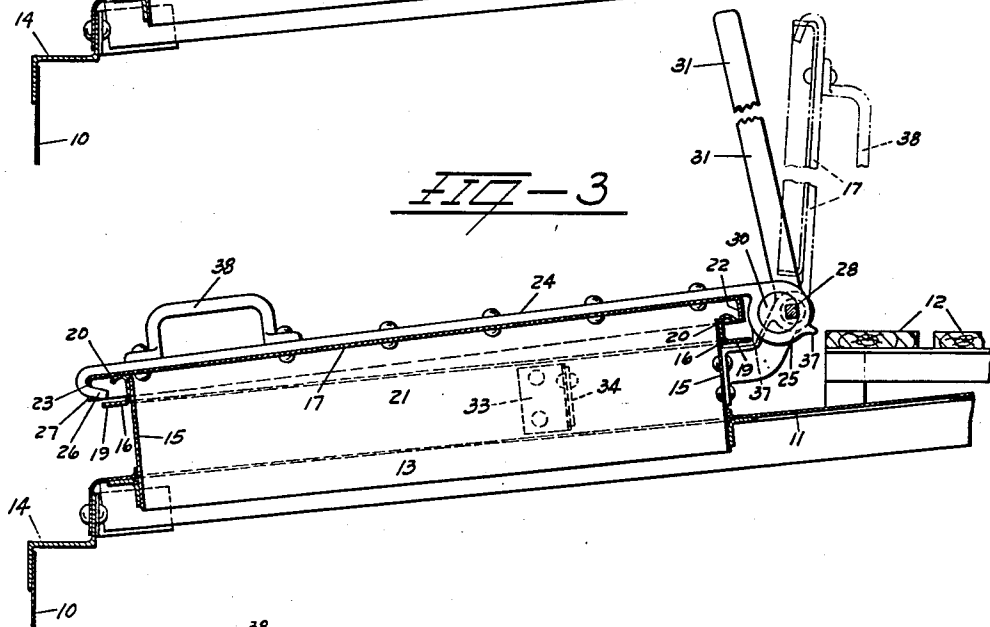
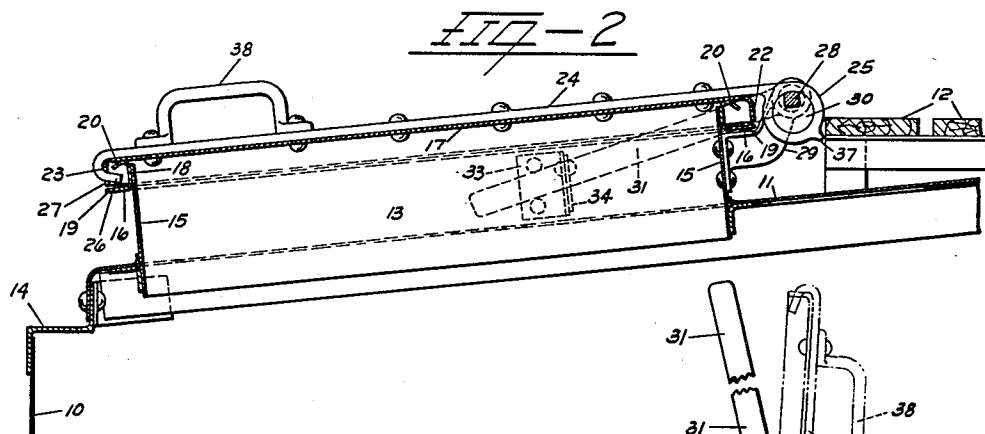
F. DITCHFIELD

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RAILWAY HATCH COVER AND LOCKING MEANS THEREFOR

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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RAILWAY HATCH COVER AND LOCKING
MEANS THEREFORFrank Ditchfield, Cleveland, Ohio, assignor to The
Youngstown Steel Door Company, Cleveland,
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Application March 9, 1944, Serial No. 525,778

13 Claims. (Cl. 105—377)

This invention relates to hatch covers and locking means therefor and more particularly to hatch covers and locking means for covered railway hopper cars.

It is an object of this invention to provide hatch covers particularly adapted for covered railway hopper cars and means for locking a series of covers by the operation of a single lever characterized by a substantial reduction in the number of parts required.

A further object is to provide hatch covers particularly adapted for covered railway hopper cars and locking means therefor which shall afford absolute safety of operation.

A further object is to provide hatch covers so constructed as to embody locking means.

A further object is to provide hatch covers and means operable for locking a series of covers wherein each cover in a series is adapted to be locked upon its frame independently of the remaining covers.

A further object is to provide hatch covers and means for imparting movement to said covers for locking and unlocking the same.

Other objects of the invention will become clear as the description thereof proceeds.

In the drawings forming part of this specification:

Fig. 1 is a plan view of a portion of a roof of a covered hopper car showing a series of hatches, covers therefor, and means for locking the covers, embodying the instant invention.

Fig. 2 is a section taken on line 2—2 of Fig. 1 showing a cover in closed and locked position.

Fig. 3 is a view similar to Fig. 2 showing the cover in closed and unlocked position and the corresponding position of an operating lever and in dot and dash lines the position of the cover when open.

Fig. 4 is a section taken on line 4—4 of Fig. 1.

Fig. 5 is a partial section similar to Fig. 2 showing another embodiment of the invention.

Referring to the drawings, the numeral 10 designates a portion of a covered railway hopper car provided with a roof designated generally by the reference numeral 11. The roof carries the usual running board 12 and is provided with a plurality of hatches 13 which, as clearly shown in Fig. 1 of the drawings, are disposed in longitudinally spaced relationship between the running board 12 and the eaves 14 of the roof. It is to be understood that while four hatches are illustrated in Fig. 1 of the drawings the number may be more or less than illustrated, and it is to be further understood that the arrangement

and number of hatches will generally be repeated on the portion of the roof not illustrated which complements the portion that is illustrated.

Loading of the hopper car takes place through the hatches 13 each of which is provided with a hatch frame 15 entirely surrounding the hatch. The hatch frame may be of any desired construction and may be secured to the roof around the hatch in any desired manner. Each of the hatch frames is provided with a member 16 at the upper portion of the frame extending around the frame and providing means for weatherproofing the frame and a seat for a hatch cover 17. As more clearly illustrated in Figs. 2 and 3 of the drawings, the member 16 is substantially channel-shaped in section and comprises a web 18 by means of which the member is secured to the hatch frame, a lower flange 19 extending outwardly from the web substantially at a right angle thereto and an upper downwardly inclined flange 20. The hatch covers 17 are adapted to be supported when in closed position upon the flange 20 of the member 16.

With reference to Figs. 2 and 4 of the drawings, it will be seen that each hatch cover 17, which is preferably formed of sheet metal, is provided with depending flanges 21 along its side edges, a depending flange 22 along its inner edge, and a depending flange 23 along its outer edge. These flanges 21, 22, and 23 terminate, as more clearly shown in Figs. 2 and 4 of the drawings, closely adjacent to the outwardly directed flange 19 of the member 16 and cooperate therewith to aid in excluding the elements from entering the hatches. Any elements which may pass between the depending flanges on the hatch cover and the flange 19 of the member 16 will be trapped by the downwardly inclined flange 20 of the member 16 so as to prevent such elements from entering the hatches. From Fig. 2 of the drawings it will be seen that the hatch covers are supported upon the downwardly inclined flange 20 and close the openings in the hatch frames.

Each of the hatch covers 17 carries a pair of hinge straps 24 which extend across the cover beyond the inner and outer edges thereof. The inner portion of each hinge strap is provided with a collar 25. The outer portion of each hinge strap 24 is formed with a return flange 26 which is extended inwardly of the outer edge of the cover. To permit such extension the outer depending flange 23 of each of the covers is provided with a plurality of slots 27 through which the return flanges 26 of the hinge straps project so as to lie between the flanges 19 and 20 of the

member 16. In this position the return flanges of the hinge straps are overlapped by the downwardly inclined flange 20 of the member 16. Any opening which may occur between the sides of the slots 27 in the depending flange 23 and the adjacent edges of the hinge straps may be closed by means of welding so that the effectiveness of the structure in excluding the elements is not decreased.

A shaft 28 is rotatably mounted between the running board 12 and the inner edges of the covers 17 by means of a plurality of brackets 29 secured to the hatch frames 15. The shaft 28 which is preferably rectangular in section except where it is journaled in the brackets 29 has a plurality of cams 30 eccentrically mounted thereon. As illustrated, two cams are utilized for each cover. The cams 30 are received within the collars 25 formed on the inner portions of the hinge straps 24 so that the collars are adapted to swing upon the cams. A lever 31 is secured to the shaft 28 in any desired manner for the purpose of imparting rotation thereto and to the cams 30 which rotate with the shaft. As clearly appears from Figs. 1 and 2 of the drawings, the lever 31 extends towards the eaves of the roof so that in the operation of the lever to unlock the covers the back of the operator is toward and adjacent to the running board 12 rather than toward and adjacent to the eaves 14. By this arrangement of the shaft and the lever absolute safety is afforded the operator. When the covers are in their closed and locked position and the lever is in the position shown in Figs. 1 and 2, it may be fastened in such position by means of the well-known device 32. This device embodies a member 33 extending between and secured to adjacent hatch frames and a latch 34 pivoted thereon and provided with the customary slot to engage the lever. Alined openings 35 and 36 in the member 33 and in the pivoted member 34 provide means for the reception of a seal by which the lever is sealed in the locked position of the covers.

Figs. 1 and 2 of the drawings illustrate the hatch covers in their closed and locked position. The relationship between the return flanges 26 of the hinge straps 24 and the downwardly inclined flange 20 at the outer edge of the hatch frames precludes upward swinging movement of the covers. In this position of the covers the eccentric relationship between the shaft 28 and the cams 30 mounted thereon is as shown in Fig. 2 of the drawings. To unlock the hatch covers so that they may be swung to the open position indicated by the dot and dash lines in Fig. 3 of the drawings, the seal (not shown) is removed and the pivoted latch member 34 disengaged from the lever 31. With his back toward the running board the operator can then swing the lever 31 toward himself, thereby imparting clockwise rotation to the shaft as viewed in Fig. 2 of the drawings. Similar rotation is thereupon imparted to the cams 30 which by their rotation within the collars 25 impart a motion of translation to the hinge straps 24 and to the covers 17 to which the straps are secured. At the same time the covers 17 are raised above the member 16 of the hatch frames except at the outwardly inclined flange 20 along the outer edge of the hatch frames so that the amount of friction encountered in the motion of the hatch covers is materially reduced. Rotation of the shaft and cams and outward movement of the hatch covers continue until engagement between

stop lugs 37 and the brackets 29 occurs. The position of the lever and the position of the hatch covers is then as shown in Fig. 3 of the drawings in full lines. From this figure, it will be seen that the return flanges 26 on the hinge straps 24 have been fully disengaged from the downwardly inclined flange 20 along the outer edge of the hatch frames so that the hatch covers may then be swung about the cams 30 by means of handles 38 to the open position indicated by the dot and dash lines.

When it is desired to close the hatch covers, they are first swung about the cams 30 to the position shown in Fig. 3 of the drawings. The lever 31 is then pushed downwardly and the resulting rotation imparted to the shaft and the cams 30 imparts motion of translation to the covers in the opposite direction so as to again bring about the locking relationship between the return flanges 26 of the hinge straps and the outwardly inclined flange 20 along the outer edge of the hatch frames. The lever may then be locked and sealed as indicated hereinabove.

A modified form of the invention is illustrated in Fig. 5 of the drawings. In this form the hinge straps 39, which are formed with collars 25 as described hereinabove, terminate short of the outer edge of the cover 40. The hatch covers are provided with depending flanges along their sides and inner edge similar to the depending flanges 21 and 22. Along the outer edge of each of the covers a depending flange 41 is provided which is downwardly and inwardly inclined, as illustrated, and adapted to be disposed between the flanges 19 and 20 of the frame member 16. The relationship between the downwardly and inwardly inclined flange 41 of each cover and the downwardly and outwardly inclined flange 20 of each of the frame members 16 prevents upward swinging movement of the covers until they are shifted from the position shown in Fig. 2 of the drawings to the position shown in Fig. 3 of the drawings. The mechanism and mode of operation of the covers 40 is the same as that described for the covers 17.

It will be apparent that the instant invention provides absolute safety of operation of the hatch covers and that locking thereof is obtained with a minimum number of parts. Each of the hatch covers is swingable relative to its frame independently of the other covers. The operation of locking the covers is therefore unaffected by variations in the height of the hatch frames above the roof. Locking of each of the covers is thereby insured while obviating precision of frame construction.

The invention has been illustrated and described in connection with a covered hopper car wherein all of its many advantages are realized.

It is to be understood, however, that the invention is not limited to such application but may be utilized as well in connection with refrigerator cars, LCL containers and hatches in general.

It will be apparent that numerous changes and modifications in the details of the invention will be clear to those skilled in the art. It is intended, therefore, that all such modifications and changes be comprehended within this invention which is to be limited only by the scope of the claims appended hereto.

I claim:

1. In a railway car having a roof, longitudinally spaced hatches in said roof, a frame secured to said roof around each of said hatches, a cover for each of said frames, a longitudinally

extending rotatably mounted shaft adjacent to said covers, cams mounted on said shaft for rotation therewith, hinge straps secured to said covers, collars on said straps swingably mounted upon said cams, a lever secured to said shaft for imparting rotation thereto and movement of translation to said covers transversely of said roof, and hooks on said hinge straps, said hooks being adapted to be disposed in locking relationship with said frames by said movement of said covers in one direction to prevent upward swinging of said covers and in unlocked position by said movement of said covers in the opposite direction to permit upward swinging of said covers.

2. In a railway car having a roof, longitudinally spaced hatches in said roof, a frame secured to said roof around each of said hatches, a cover for each of said frames, a longitudinally extending rotatably mounted shaft adjacent to said covers, cams mounted on said shaft for rotation therewith, hinge straps secured to said covers, collars on said straps swingably mounted upon said cams, means for rotating said shaft and shifting said covers transversely of said roof, and means on said hinge straps adapted to lock said covers against upward swinging movement when said covers are shifted in one direction, said covers being unlocked for upward swinging movement when shifted in the opposite direction.

3. In a railway car having a roof, longitudinally spaced hatches in said roof, a frame secured to said roof around each of said hatches, a cover for each of said frames, a longitudinally extending rotatably mounted shaft adjacent to said covers, cams mounted on said shaft for rotation therewith, hinge straps secured to said covers, collars on said straps swingably mounted upon said cams, means for rotating said shaft and shifting said covers transversely of said roof, and means for locking said covers against upward swinging movement, said locking means being moved to locking position by the shifting of said covers in one direction, said locking means being unlocked by the shifting of said covers in the opposite direction to permit upward swinging movement of said covers.

4. In a railway car having a roof, longitudinally spaced hatches in said roof located between the running board and the eaves of said roof, a frame secured to said roof around each of said hatches, a cover for each of said frames, a longitudinally extending rotatably mounted shaft disposed between said covers and said running board, cams mounted on said shaft for rotation therewith, means swingably mounting said covers upon said cams, a lever secured to said shaft and extending toward the eaves of the roof for rotating said shaft and shifting said covers transversely of said roof, and means responsive to the shifting of said covers for locking said covers against upward swinging movement and unlocking said covers for upward swinging movement.

5. In a railway car having a roof, longitudinally spaced hatches in said roof, a frame secured to said roof around each of said hatches, a cover for each of said frames, a longitudinally extending rotatably mounted shaft, cams mounted on said shaft for rotation therewith, means swingably mounting said covers upon said cams, a lever for rotating said shaft and shifting said covers transversely of said roof, and means responsive to the shifting of said covers for locking said covers against upward swinging move-

ment and unlocking said covers for upward swinging movement.

6. In a railway car having a roof, spaced hatches in said roof, a frame secured to said roof around each of said hatches, flanges on said frames, a cover for each of said frames, a rotatably mounted shaft, cams mounted on said shaft for rotation therewith, means swingably mounting said covers upon said cams, a lever for rotating said shaft and shifting said covers, and flanges on said covers, said cover flanges being adapted to be disposed under said flanges on said frames to lock said covers against upward swinging movement when said covers are shifted in one direction, said cover flanges being adapted to be disengaged from said flanges on said frames to unlock said covers for upward swinging movement when said covers are shifted in the opposite direction.

7. In a railway car having a roof, spaced hatches in said roof, a frame secured to said roof around each of said hatches, flanges on said frames, a cover for each of said frames, a rotatably mounted shaft, cams mounted on said shaft for rotation therewith, means swingably mounting said covers upon said cams, a lever for rotating said shaft and shifting said covers, and hooks on the free edges of said covers, said hooks being adapted to be disposed under said flanges on said frames to lock said covers against upward swinging movement and disengaged from said flanges on said frames to unlock said covers for upward swinging movement upon shifting of said covers.

8. In a railway car having a roof, spaced hatches in said roof, a frame secured to said roof around each of said hatches, flanges on said frames, a cover for each of said frames, a rotatably mounted shaft, cams mounted on said shaft for rotation therewith, means swingably mounting said covers upon said cams, a lever for rotating said shaft and shifting said covers, the free edges of said covers being flanged to provide hooks, said hooks being adapted to be disposed under said flanges on said frames to lock said covers against upward swinging movement and disengaged from said flanges on said frames to unlock said covers for upward swinging movement upon shifting of said covers.

9. In a railway car having a roof, spaced hatches in said roof, a frame secured to said roof around each of said hatches, a cover for each of said frames, a rotatably mounted shaft adjacent to said covers, means connecting said shaft and said covers, said means being connected to said shaft for rotation therewith and said covers being swingably mounted upon said means in such a way that rotation of said shaft imparts movement of translation to said covers, and locking means on said covers, said locking means being moved to locking position to prevent upward swinging of said covers upon movement of said covers in one direction and to unlocking position to permit upward swinging of said covers when said covers are moved in the opposite direction.

10. In combination, a hatch cover adapted to be supported upon a frame secured around a hatch, a rotatably mounted shaft, cams mounted on said shaft for rotation therewith, means swingably mounting said cover upon said cams, a lever for rotating said shaft and shifting said cover, and one or more hooks on the free edge of said cover, said hooks being adapted to lock said cover against upward swinging movement when said cover is shifted in one direction, and

to unlock said cover to permit upward swinging movement thereof when said cover is shifted in the opposite direction.

11. In combination, a hatch cover adapted to be supported upon a frame secured around a hatch, a rotatably mounted shaft, cams mounted on said shaft for rotation therewith, means swingably mounting said cover upon said cams, a lever for rotating said shaft and shifting said cover, and cooperating flanges on said cover and said frame, said flanges being disposed in locking position to lock said cover against upward swinging movement when said cover is shifted in one direction and to unlocking position to permit upward swinging movement of said cover when said cover is shifted in the opposite direction.

12. A cover for hatches adapted to be supported for swinging movement upon a frame secured around a hatch, said cover comprising a body portion and depending flanges around the periphery of said body portion, one of said flanges being in the form of a hook adapted to lock said cover against swinging movement.

13. A cover for hatches adapted to be supported for swinging movement upon a frame secured around a hatch, said cover having one or more hinge straps secured thereto, said straps having collars on one end adapted to mount said cover for swinging movement, and having hook shaped portions on the other end adapted to lock said cover against swinging movement.

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